

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re Patent Application of )  
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THOMAS LANG ) Group Art Unit: Unassigned  
 )  
Application No.: Unassigned ) Examiner: Unassigned  
 )  
Filed: November 20, 2001 )  
 )  
For: HIGH-POWER SEMICONDUCTOR )  
MODULE, AND USE OF SUCH A )  
HIGH-POWER SEMICONDUCTOR )  
MODULE )

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, D.C. 20231

Sir:

Prior to examination of the above-captioned patent application, applicant requests that the following claim amendments be entered. Additional amendments are incorporated in the formatted Substitute Specification submitted herewith. A copy of the original application, together with a CompareRite® version showing the amendments made to the original application, in accordance with 37 C.F.R. §1.121 (2001), are also submitted herewith. No new matter has been introduced in these amendments to the original specification.

**IN THE CLAIMS:**

Please replace Claims 1-13 as follows.

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1. (Amended) A high-power semiconductor module, in which a number of flat semiconductor chips rest with their lower face flat on a base plate, establishing first electrical contacts, and have a cover plate, which is arranged parallel to the base plate, applied to their upper face with pressure, establishing second electrical contacts, wherein those faces, or outer faces, of the base plate and of the cover plate which face away from the semiconductor chips are each electrically isolated from the semiconductor chips.

2. (Amended) The high-power semiconductor module as claimed in claim 1, wherein a first electrically conductive, elastic connecting element, preferably in the form of a first contact spring, is arranged between the upper face of each semiconductor chip and the cover plate.

3. (Amended) The high-power semiconductor module as claimed in claim 1, wherein the base plate comprises an electrically insulating substrate which has a first metal coating on the inner face, and wherein the semiconductor chips are mounted, preferably by techniques such as bonding, soldering or welding, preferably by soldering, on the first metal coating.

4. (Amended) The high-power semiconductor module as claimed in claim 3, wherein the substrate is composed of a ceramic, preferably an AlN ceramic.

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5. (Amended) The high-power semiconductor module as claimed in claim 3, wherein the base plate is provided with a second metal coating on the outer face.

6. (Amended) The high-power semiconductor module as claimed in claim 3, wherein, in an area located outside the semiconductor chips, pressure is applied to the first metal coating by the cover plate, thus establishing a third electrical contact.

7. (Amended) The high-power semiconductor module as claimed in claim 6, wherein the third electrical contact is established via a second electrically conductive, elastic connecting element, preferably in the form of a second contact spring.

8. (Amended) The high-power semiconductor module as claimed in claim 6, wherein the cover plate comprises a first isolation plate, on whose inner face a first metallic contact plate is arranged, via which the second electrical contacts with the semiconductor chips are established, and wherein a second metallic contact plate is arranged on the first metallic contact plate, and electrically isolated from it, via which the third electrical contact with the first metal coating on the base plate is established.

9. (Amended) The high-power semiconductor module as claimed in claim 8, wherein the first and the second metallic contact plates are isolated from one another by a second isolation plate.

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10. (Amended) The high-power semiconductor module as claimed in claim 1, wherein an electrically insulating housing is arranged between the base plate and the cover plate, and encloses the semiconductor chips and the associated contact devices.

11. (Amended) The high-power semiconductor module as claimed in claim 1, wherein the semiconductor chips are connected electrically in parallel within the high-power semiconductor module.

12. (Amended) The high-power semiconductor module as claimed in claim 11, wherein at least some of the semiconductor chips are controllable semiconductor switches, in particular IGBTs.

13. (Amended) Use of a high-power semiconductor module as claimed in claim 1, in which the high-power semiconductor module is arranged together with a cooling apparatus, which is adjacent to the outer face of the base plate, to form a stack, and pressure is applied to it in the stack.

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## REMARKS

Early and favorable consideration with respect to this application is respectfully requested.

Respectfully submitted,  
BURNS, DOANE, SWECKER & MATHIS, L.L.P.

By:

Robert S. Swecker  
Registration No. 19,885

Date: November 20, 2001

**Attachment to Preliminary Amendment dated November 20, 2001**

**Marked-up Claims 1-13**

1. (Amended) A high-power semiconductor module [(10)], in which a number of flat semiconductor chips [(14)] rest with their lower face flat on a base plate [(11)], establishing first electrical contacts, and have a cover plate [(13)], which is arranged parallel to the base plate [(11)], applied to their upper face with pressure, establishing second electrical contacts, [characterized in that] wherein those faces, or outer faces, of the base plate [(11)] and of the cover plate [(13)] which face away from the semiconductor chips [(14)] are each electrically isolated from the semiconductor chips [(14)].

2. (Amended) The high-power semiconductor module as claimed in claim 1, [characterized in that] wherein a first electrically conductive, elastic connecting element, preferably in the form of a first contact spring [(15)], is arranged between the upper face of each semiconductor chip [(14)] and the cover plate [(13)].

3. (Amended) The high-power semiconductor module as claimed in [one of claims 1 or 2] claim 1, [characterized in that] wherein the base plate [(11)] comprises an electrically insulating substrate [(17)] which has a first metal coating [(19)] on the inner face, and [in that] wherein the semiconductor chips [(14)] are mounted, preferably by techniques such as bonding, soldering or welding, preferably by soldering, on the first metal coating [(19)].

### Marked-up Claims 1-13

4. (Amended) The high-power semiconductor module as claimed in claim 3, [characterized in that] wherein the substrate [(17)] is composed of a ceramic, preferably an AlN ceramic.
5. (Amended) The high-power semiconductor module as claimed in [one of claims 3 or 4] claim 3, [characterized in that] wherein the base plate [(11)] is provided with a second metal coating [(18)] on the outer face.
6. (Amended) The high-power semiconductor module as claimed in [one of claims 3 to 5] claim 3, [characterized in that] wherein, in an area located outside the semiconductor chips [(14)], pressure is applied to the first metal coating [(19)] by the cover plate [(13)], thus establishing a third electrical contact.
7. (Amended) The high-power semiconductor module as claimed in claim 6, [characterized in that] wherein the third electrical contact is established via a second electrically conductive, elastic connecting element, preferably in the form of a second contact spring [(16)].
8. (Amended) The high-power semiconductor module as claimed in [one of claims 6 or 7] claim 6, [characterized in that] wherein the cover plate [(13)] comprises a first isolation

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**Marked-up Claims 1-13**

plate [(20)], on whose inner face a first metallic contact plate [(21)] is arranged, via which the second electrical contacts with the semiconductor chips [(14)] are established, and [in that] wherein a second metallic contact plate [(23)] is arranged on the first metallic contact plate [(21)], and electrically isolated from it, via which the third electrical contact with the first metal coating [(19)] on the base plate [(11)] is established.

9. (Amended) The high-power semiconductor module as claimed in claim 8, [characterized in that] wherein the first and the second metallic contact plates [(21 and 23, respectively)] are isolated from one another by a second isolation plate [(22)].

10. (Amended) The high-power semiconductor module as claimed in [one of claims 1 to 9] claim 1, [characterized in that] wherein an electrically insulating housing [(12)] is arranged between the base plate [(11)] and the cover plate [(13)], and encloses the semiconductor chips [(14)] and the associated contact devices [(15, 16)].

11. (Amended) The high-power semiconductor module as claimed in [one of claims 1 to 10] claim 1, [characterized in that] wherein the semiconductor chips [(14)] are connected electrically in parallel within the high-power semiconductor module [(10)].



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**Marked-up Claims 1-13**

12. (Amended) The high-power semiconductor module as claimed in claim 11, [characterized in that] wherein at least some of the semiconductor chips [(14)] are controllable semiconductor switches, in particular IGBTs.

13. (Amended) Use of a high-power semiconductor module as claimed in [one of claims 1 to 12 in a power-electronics system] claim 1, in which the high-power semiconductor module [(10)] is arranged together with a cooling apparatus [(24)], which is adjacent to the outer face of the base plate [(11)], to form a stack, and pressure is applied to it in the stack.